

Susquehanna 1

3Q/2008 Plant Inspection Findings

Initiating Events

Mitigating Systems

G

Significance: Sep 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

HPCI and RCIC Made Inoperable Due to Operator Actions During Shutdown

The inspectors identified a NCV of Susquehanna Unit 1 Technical Specifications (TS) 3.5.1 and 3.5.3 for rendering high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) inoperable during a planned shutdown. Specifically, both the HPCI and RCIC systems were made inoperable to fulfill their TS described safety function when operators raised reactor vessel level above the HPCI and RCIC turbine trip signals in a plant mode and at a plant pressure where both of these systems were required to be fully operable. PPL Susquehanna, LLC (PPL) initiated corrective actions to revise the shutdown procedure to prevent reactor vessel water level from being raised above the trip input level until low pressure (LP) emergency core cooling system (ECCS) are capable of being used.

This finding is more than minor because it is associated with the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). The finding was evaluated for significance using IMC 0609, Attachment 4, "Phase 1 Initial Screening and Characterization of Findings." Since the finding did not result in a loss of safety function or the loss of a train for greater than its TS allowed outage time, and was not potentially risk significant due to external event initiators, the finding was determined to be of very low safety significance (Green). This finding is related to the cross-cutting area of Human Performance – Resources because PPL did not ensure that personnel, equipment, procedures, and other resources were available and adequate to assure nuclear safety. (H.2(c)) (1R15)

Inspection Report# : [2008004](#) (*pdf*)

Significance: SL-IV Jul 14, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Provide Complete and Accurate NRC License Application

Severity Level IV: The NRC identified a Level IV non-cited violation of 10 CFR 50.9, "Completeness and Accuracy of Information" because PPL submitted a license application for a reactor operator to take an initial NRC license examination that incorrectly stated that the applicant was medically qualified with restrictions. The performance was reviewed for any cross cutting aspects and none were identified.

This finding was more than minor because it impacted the NRC's ability to perform its regulatory function and was therefore evaluated using the traditional enforcement process. Specifically, PPL submitted a license application for a reactor operator to take an NRC license examination that incorrectly stated that the applicant was medically qualified with restrictions. This information could have resulted in an operator being licensed that was not medically qualified. The finding is of very low significance because it did not result in the NRC making an incorrect licensing decision and PPL took adequate corrective actions and on July 14, 2008 requested withdrawal of this reactor operator license application. (Section 40A5)

Inspection Report# : [2008302](#) (*pdf*)

G

Significance: Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Adequately Evaluate a Deviation from BWROG EPG/SAG Resulted in an Inadequate EOP

The NRC identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," because, in the 1990s, Susquehanna failed to adequately evaluate a deviation from the Boiling Water Reactor Owner's Group Emergency Procedure Guidelines / Severe Accident Guidelines (BWROG EPG/SAG), which resulted in one of the emergency operating procedures (EOPs) being inadequate. Specifically, Caution #1 in the BWROG EPG/SAG warned the operators that reactor pressure vessel (RPV) level instrumentation may be unreliable if the drywell temperatures exceeded RPV saturation temperature. The purpose of the Caution was to give the operators a chance to evaluate the validity of the RPV level instrumentation to avoid premature entry into the RPV flooding contingency procedure.

Susquehanna did not adequately evaluate the deviation, and the Susquehanna EOPs did not use a Caution statement; but instead, changed the caution to a procedural step, which directed the operators to transition directly to the RPV flooding procedure.

The performance deficiency is more than minor because it is associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and affects the objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent

undesirable consequences. Specifically, the EOP could have directed entry into the RPV flooding procedure unnecessarily which would have restricted the use of suppression pool cooling and required other actions that would have complicated the operators' response to the event. The finding was determined to be of very low safety significance because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events. (Section 40A2.a.3 (a))

Inspection Report# : [2008006](#) (*pdf*)

G

Significance: Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

failure to Identify and Correct Inconsistencies in the Licensing Basis and the EOPs

The NRC identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to identify that an inconsistency between the procedures and the design basis for suppression pool (SP) cooling was a condition adverse to quality (CAQ), which resulted in corrective actions not being taken in a timely manner. Specifically, in January 2006, a Condition Report (CR) identified an inconsistency between an assumption in the Final Safety Analysis Report (FSAR) for the design basis accident and the emergency operating procedures (EOPs) regarding the timing for the implementation of SP cooling. At the time of the inspection, the inconsistency had not been resolved because Susquehanna did not recognize that it impacted current plant operations. This performance deficiency has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Susquehanna did not identify that the inconsistency documented in the CR should have been categorized as a CAQ, commensurate with its safety significance. [P.1(a)] The performance deficiency is more than minor because it is associated with the Design Control attribute of Mitigating Systems and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the EOPs provided direction that, under some accident conditions, would affect the availability and/or capability of the SP cooling system to perform its safety function. The finding screened out as having very low safety significance because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events.

Inspection Report# : [2008006](#) (*pdf*)

G

Significance: Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to Accurately Model the Simulator for RPV Water Level Instrumentation

The NRC identified a Non-Cited Violation of 10 CFR 55.46(c)(1), "Plant Referenced Simulators," because the Susquehanna simulator did not accurately model reactor pressure vessel (RPV) level instrumentation following a design basis accident loss of coolant accident (DBA LOCA). Specifically, an analysis performed in 1994 to determine if the observed simulator response during a large break LOCA was consistent with the expected plant response, was based on an overly conservative assumption that the drywell would experience superheated conditions, which would cause RPV water level instrumentation reference leg flashing and a subsequent loss of all RPV level indication. The expected plant response, as stated in the analysis, was incorrect; in that a LOCA would not always cause a loss of all RPV level instruments. As a result, the simulator modeling was incorrect.

The performance deficiency is more than minor because it is associated with the Human Performance attribute of Mitigating Systems and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the modeling of the Susquehanna simulator introduced negative operator training that could affect the ability of the operators (a mitigating system) to take the appropriate actions during an actual event. The finding was determined to be of very low safety significance because it is not related to operator performance during requalification, it is related to simulator fidelity, and it could have a negative impact on operator actions.

Inspection Report# : [2008006](#) (*pdf*)

G

Significance: Feb 01, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Failure to identify and Correct a Setpoint Error in the RHR and CS Operating Procedures

The NRC identified a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to identify that a setpoint error in the operating procedures for safety-related systems was a condition adverse to quality (CAQ), resulting in the procedures not being corrected in a timely manner. The setpoint for the low pressure injection permissive interlock in the RHR and CS systems had been changed in 1999 as part of a modification. However, the setpoint was not changed in the system operating procedures and operator aids. When this issue was identified by Susquehanna staff in 2006, the setpoint error in the procedure was not screened as a CAQ, which resulted in the procedures not being revised for 17 months after the issue was identified in an Action Report. This performance deficiency has a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Susquehanna did not identify that a setpoint error in operating procedures for safety-related systems was a CAQ, commensurate with its safety significance. [P.1(a)] The performance deficiency is more than minor because it is associated with the Procedure Quality attribute of Mitigating Systems and affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the incorrect setpoint reference in the procedure impacted the reliability of operator response to the

event in that it could delay operator actions or result in misoperation of equipment. The finding screened out as having very low safety significance because it was not a design deficiency, did not result in an actual loss of safety function, and did not screen as potentially risk significant due to external initiating events.

Inspection Report# : [2008006](#) (*pdf*)

Barrier Integrity

G

Significance: Dec 31, 2007

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

Inadequate Design Control to Support Fuel Rechanneling Activities

A self-revealing non-cited violation of 10CFR 50 Appendix B, Criterion III, "Design Control," was identified on December 6, 2007, when PPL maintenance personnel found broken pieces of fuel spacer grid assemblies at fuel preparation machines. The damage to fuel assembly spacer assemblies was determined to be from rechanneling activities performed on or before October 20, 2007. The cause of the damaged fuel assemblies was due to the differing exposure histories of fuel channels and fuel bundle spacers not having been adequately analyzed prior to performance of the fuel rechanneling activities. Inspectors determined that the engineering analysis which implemented the allowable applied force limit used in fuel rechanneling procedures had not verified design interfaces, and did not verify the adequacy of design limits. PPL determined that the extent of condition was limited to those rechanneled fuel assemblies re-installed in the Unit 1 or Unit 2 reactors with greater than 25 GigaWatt-Days per Metric Tonne Uranium (GWD/MTU) average exposure.

This finding was more than minor because the finding is related to the Design Control and Human Performance attributes of the barrier integrity cornerstone and negatively impacts the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding) protect the public from radio nuclide releases caused by accidents or events. The inspectors completed a Phase 1 significance determination using IMC 0609 Appendix A, Significance Determination Process Phase 1 screening worksheet, and determined the finding to be of Very Low Safety Significance (Green) because the performance issue only degraded the Fuel Cladding Barrier and its associated cornerstone.

This finding is related to a cross-cutting component in the area of Human Performance associated with work practices H.4.(c) because PPL did not ensure supervisory and management oversight of specific work activities, specifically design reviews which supported the fuel rechanneling procedures used from October 2005 through October 2007 and the collective evaluation of 25 condition reports related to rechanneling difficulties. PPL entered this issue into the corrective action program and promptly initiated compensatory measures to impose fuel thermal limit penalties to assure fuel barrier integrity during reactor operation.

Inspection Report# : [2007005](#) (*pdf*)

Emergency Preparedness

G

Significance: Sep 29, 2008

Identified By: NRC

Item Type: NCV NonCited Violation

Inadequate Equipment to Assess Threshold for Emergency Action Level

The inspectors identified a NCV associated with emergency planning standard 10 CFR 50.47(b)(4). The inspectors determined that a performance deficiency existed in that inadequate indications were available for operators to determine if a threshold for emergency action levels (EALs) based on sustained wind speed in the protected area, had been met. On the afternoon of July 17, 2008, a severe thunderstorm with winds in excess of 50 miles per hour (mph) passed through the plant site. The storm caused damage to non-vital structures and resulted in the loss of two, 13.2 kilovolts (kV) power lines which interrupted power to several non-power block buildings on site. Inspectors observed operators responding to the event and identified that the wind speed indicator in the control room had indicated the maximum value for several minutes. This recorder only displayed wind speeds up to a maximum of 50 mph. Inspectors also observed that the backup wind speed indication, located 6 miles from the site and which reads from 0-100 mph, was inoperable during the storm. Inspectors identified that the Unit Supervisor had mistakenly read the wind direction trace on the recorder and had determined a 65 mph wind speed in error. Based upon direct observations during this adverse weather event, the inspectors determined that the operators did not have adequate indications available to determine if the threshold, sustained winds of greater than 80 mph, for EALs OA5 or OU5, had been met.

This finding is greater than minor because it was associated with the Emergency Preparedness (EP) cornerstone attribute of Facilities and Equipment, and affected the cornerstone objective of ensuring that a licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. This finding is of very low safety significance (Green) because it did not result in the Risk-Significant Planning Standard Function being lost or degraded. This finding is related to the cross-cutting area of Problem Identification and Resolution Corrective Action Program because PPL did not take appropriate corrective actions to address a safety issue in a timely manner, commensurate with its safety significance and complexity. Specifically, the NRC had previously identified this potential vulnerability over two years prior to the event and the licensee had entered the concern into their CAP; however, corrective actions

were not implemented. [P.1(d)] (Section 1R01)

Inspection Report# : [2008004](#) (*pdf*)

Occupational Radiation Safety



Significance: Dec 31, 2007

Identified By: Self-Revealing

Item Type: FIN Finding

Failure to Maintain Occupational Radiation Exposure As Low As Reasonably Achievable During CREOAS Work

A self-revealing finding having very low safety significance was identified due to a deficiency in the area of maintaining occupational radiation exposures as low as is reasonably achievable (ALARA). ALARA and work planning for the control room emergency outside air supply system (CREOAS) modification was less than adequate resulting in collective exposure for the work to expand from 3.37 person-rem to 11.9 person-rem.

The performance deficiency that resulted in the exposure overrun was due to significantly increased hours beyond that planned to perform the work. The root cause of the overrun was determined to be: (1) a failure to include contractor work hours in the ALARA planning process; and (2) design errors which did not properly identify bolting locations for the duct work, requiring extensive on-site rework. Susquehanna's three-year rolling average is 101 Person-rem, which is below the SDP criteria of 240 person-rem for Boiling Water Reactors (BWRs), therefore, overall ALARA performance has been effective and this finding is of very low safety significance.

A contributing cause of this finding was related to the Work Control aspect of the Human Performance cross-cutting area because the licensee did not appropriately coordinate work activities by incorporating actions to address the impact of the work on different job activities, and the need for work groups to maintain interfaces with offsite organizations, and communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance.

Inspection Report# : [2007005](#) (*pdf*)

Public Radiation Safety

Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

Miscellaneous

Last modified : November 26, 2008